

### 3. ALTERNATIVES

Alternatives considered in this document include: 1) doing nothing; 2) Transportation System Management Techniques (TSM); 3) providing for mass transit; 4) expanding certain areas to four lanes in each direction; 5) expanding certain areas to five lanes in each direction; 6) expanding certain areas to six lanes in each direction; 7) interchange modifications; and, 8) mixing elements of the above. The lane additions could be the addition of a full through lane or addition of lanes between two interchanges only, where a lane is added at an entrance, then dropped at the next exit. This is termed an “auxiliary” lane. Use of collector /distributor (C/D) roads were also considered and recommended in some locations to keep merge, diverge, and weaving activity apart from the mainline flow.

Consistent with state and federal guidance, this environmental document addresses how the above alternatives were considered and the process that led to the Preferred Alternative.

#### 3.1 No Action Alternative

The No Action Alternative{xe "No Action Alternative"} provides the basis for comparison with other alternatives. Normally the No Action Alternative includes only short-term maintenance and safety improvements.

The No Action Alternative{xe "No Action Alternative"} (and all subsequent alternatives) assumes a basic existing plus “committed” roadway network. Defining “committed” as those projects that have some construction funding identified in the current Transportation Improvement Program (TIP), there are no projects that would significantly affect or be affected by the proposed project. The Six Points interchange on I-70 west of the study area is now scheduled for construction beginning in 2003. There are plans to widen SR 67 from Thompson Road (west of the study area) to I-465. Preliminary engineering and land acquisition are listed in the TIP, thus far.

The No Action Alternative{xe "No Action Alternative"} would not provide any improvements to regional accessibility and would result in increased congestion.

The No Action Alternative would result in an increasingly overburdened transportation corridor with sections of the road operating at Level of Service F in the AM and PM peaks. The only section that would not operate at LOS F in the AM and the PM peak is the section between SR 67 and I-70 at the south end of the project. This section would operate at LOS D in the AM peak and at LOS E in the PM peak. There would be no improvements to safety/geometrics deficiencies. Selection of this alternative would leave Indianapolis and Marion County residents with an inadequate transportation facility that would become increasingly hazardous and congested. The No Action Alternative would not be consistent with the *Indianapolis Regional Transportation Plan for 2025*, nor INDOT’s *Long Range Plan*.

#### 3.2 Transportation System Management (TSM)

TSM techniques include changing signalization, widening lanes, providing drainage, adding sidewalks and bike lanes, minor lane additions and geometric improvements, and other relatively low cost changes that facilitate the flow of traffic. TSM techniques emphasize maximum use of existing facilities.

TSM techniques have little applicability to mainline freeways. An earlier round of lane additions within the median occurred in 1967. I-465 is a full control of access roadway that prohibits pedestrians and

bicycles. Since pedestrians and bicycles are prohibited, adding sidewalks and bike lanes will not help capacity. Since there are no signals, changes in signalization will not help. Lane widths and drainage are not problems and improvements to them would not improve capacity. This limits TSM treatments to ramp termini at crossroads. Except in those rare instances when ramps back up onto the mainline, TSM has no effect on mainline capacity and therefore does not address the fundamental need for the project. TSM treatments of ramp terminals are an important consideration in the development of any ramp reconstruction as the intent of the proposed project is to improve traffic flow both on the mainline, ramps, and cross roads.

### **3.3 Mass Transit**

Several bus routes cross I-465, but no routes travel along I-465 in the project area. The routes that cross I-465 are: Route 8, which crosses I-465 at US 40; Route 9, which crosses I-465 at the Airport Expressway; Route 10, which crosses I-465 at 10<sup>th</sup> Street; Route 15, which crosses I-465 at 38<sup>th</sup> Street and 46<sup>th</sup> Street; and, Route 40, which crosses I-465 at US 36. Mass transit options would not resolve safety and geometric deficiencies along the corridor, nor add mainline capacity. There are no plans to add significant transit capacity in the corridor. There has been some discussion of radial light rail service to the airport from downtown, crossing I-465. Planning for I-465 will take into account possible corridors and not foreclose any design options for light rail corridors.

### **3.4 Expanding I-465 to Four, Five, or Six Lanes in Each Direction**

Capacity analysis has determined that providing four lanes in each direction on I-465 would provide an inadequate Level of Service in the corridor, LOS E in the south section of the corridor from SR 67 to US 40 and F north to 38th Street. Providing five lanes in each direction would provide the minimum allowed LOS in the corridor, LOS D. Providing six lanes in each direction would provide a LOS of C through the length of the corridor.

The number of lanes noted above and the associated LOS were refined in the course of analysis. Refinement consisted primarily of determining where auxiliary lanes could best serve traffic and minimize impacts. If auxiliary lanes are used bridge costs may be reduced by not carrying the extra lane over or under cross roads. In addition, merge lengths are increased, improving traffic flow. With auxiliary lanes, the driver has the added distance to the next exit for decision-making and a merge instead of coming to the end of the entrance ramp and having to merge. Also, some drivers now travel over I-465 for only one interchange. They would never leave the auxiliary lane and would not merge onto the mainline.

INDOT's decision to provide four through lanes in each direction with auxiliary lanes running from the entrance ramp of one interchange to the exit ramp of the adjacent downstream interchange was coordinated with the FHWA during the development of the Engineer's Report. Providing five through lanes in each direction with standard entrance and exit ramps would have a much more severe impact on the neighboring properties for this built-up corridor. With the spacing of the interchanges along the west leg of I-465 (many of the interchanges being spaced only 1 mile apart), and with many of the ramps being dual lane, a continuous auxiliary lane between interchanges is appropriate. In many cases, without auxiliary lanes, the entrance taper of one ramp would overlap the exit taper of the ramp at the downstream interchange.

The continuous auxiliary lane configuration is common for urban corridors such as I-465 with high

commuter traffic and high driver familiarity. Signing and special lane striping for the auxiliary lanes could be utilized to minimize any potential driver confusion. Also, the uniform application of the auxiliary lane concept throughout the corridor will help minimize confusion. Motorists who incorrectly remain in an auxiliary lane and find themselves on an exit ramp of an interchange can safely travel through the interchange and work their way back to I-465 via the local network.

The total number of mainline and auxiliary lanes in each direction is shown in Table 2-3 and in Figure 2-2.

### 3.5 Interchange Modifications

All interchanges were carefully analyzed in terms of their current operation, projected traffic, up-to-date design standards, environmental constraints (natural and human environment), driver expectation, traffic flow on cross roads, and constructability. See Figure 1-3 for the configurations of the existing and proposed interchanges.

#### 3.5.1 SR 67

This intersection is “flopped” today, meaning all the ramps are on one side. This is due to the presence of an active railroad that parallels the northwest side of SR 67. It was determined that the railroad will remain active. Rail traffic is expected to continue at one train a day. In other words, the rail line will not be abandoned, and the new interchange design must accommodate it. A number of configurations examined moving the railroad to allow room for an interchange with ramps on both sides of SR 67. Shifting the railroad would have required costly INDOT purchase of right-of-way for the rail provider, and would have affected one rail customer. The introduced curve in the rail tracks would have led to long-term maintenance costs that the rail provider would have sought from INDOT through a maintenance agreement. Finally, the configuration would have required reconstruction of Hanna Avenue. Hanna Avenue passes over I-465 today, but with a shifted rail line, I-465 would have to be built over a depressed Hanna Avenue.

A second alternative considered shifting SR 67 away from the railroad, rather than shifting the railroad. Such a shift would have resulted in substantial impacts on the surrounding land uses, especially existing residential development. There were also substantial geometric problems with the resulting curvature to be introduced into SR 67.

With movement of the railroad and SR 67 infeasible, design analysis focused on how to enhance the basic flopped configuration. One alternative was to provide a “flyover” ramp to serve the heavy eastbound to northbound movement through the interchange. Unfortunately, planned development in the southwest quadrant of the interchange has reached a sufficiently advanced stage that the land needed for the flyover ramp is already committed.

The result is that the basic configuration of the interchange as it is today will be enhanced. Changes are summarized by movement.

Mainline - Northbound to eastbound - similar to today, improvements to ramp terminus  
Northbound to westbound – similar to today, improvements to ramp terminus  
Southbound to eastbound – similar to today, improvements to ramp terminus  
Southbound to westbound – similar to today, improvements to ramp terminus

- SR 67      -      Eastbound to northbound – free-flow loop on-ramp  
                         Eastbound to southbound – similar to today  
                         Westbound to northbound – similar to today with improved turn lanes feeding ramp  
                         Westbound to southbound - similar to today with improved turn lanes feeding ramp

Additional engineering considerations at this location are merging the northbound ramp traffic coming from east- and westbound SR 67 and weaving it with the northbound exit ramp to I-70. This would be accomplished with a collector-distributor (C-D) road.

### **3.5.2    I-70**

At I-70 the north- and southbound exits from I-465 would be similar to those of today. A loop ramp would continue to serve the southbound to eastbound movement. This movement has little traffic demand, as most drivers complete the I-465 southbound to I-70 eastbound movement via the Airport Expressway, where there is today and will be in the future, a directional ramp serving this movement. For movements from eastbound I-70 to northbound I-465 and westbound I-70 to southbound I-465 new directional ramps will be provided where there are presently loop ramps. Provision of directional ramps was considered for all movements, as this is an interstate to interstate connection. However, the typical four-stack design of such interchanges was not desirable due to the proximity of the airport runways and consequent height restrictions. A four-stack interchange is a fully directional interchange with no loop ramps. Instead, all typical loop ramps found in a full cloverleaf interchange are replaced by directional ramps that, many times, cross the junction of the main lines of the two intersecting roads. This can create a configuration where four bridges are stacked on top of each other.

### **3.5.3    Airport Expressway**

This interchange is not expected to experience as much growth in traffic as other interchanges due to the planned development of a new Midfield airport terminal, to be open in 2007, and the development of the new Six Points Interchange, to be open around the end of 2004, west of I-465 on I-70 to serve as the principal entry point for that new terminal. Of concern in the reconstruction of this interchange is avoiding impacts to the commercial development on the east side of I-465. Loop ramps will continue to serve northbound to westbound, westbound to southbound, and eastbound to northbound movements. A new two-lane directional ramp will replace the existing one-lane directional ramp to serve southbound to eastbound movements. This movement is the primary way that drivers on southbound I-465 go to eastbound I-70.

### **3.5.4    US 40 / Washington Street**

The principal design goal at this location was to eliminate the weave conflicts inherent in the full cloverleaf design that is now present. This will be accomplished by eliminating the northbound to westbound and southbound to eastbound loop ramps. Single exit ramps from I-465 would take their place. Turns to both east and west would be made from these ramp termini at signalized intersections with US 40. The on-ramps to I-465 would be constructed as “collector-distributor” roads. These roads are designed to keep merge and diverge activity separate from the mainline flow. This means using a concrete safety barrier to hold C/D traffic apart from the mainline. So, in this case, for example, the traffic on the eastbound to northbound loop ramp will merge with the westbound to northbound traffic on a C/D roadway that parallels the mainline. The C/D road then merges with the mainline. This minimizes conflicts at the higher mainline speeds.

This design improves the intersection operation at High School Road by extending the distance between the southbound off-ramp and the intersection. Weave movements on I-465 and on US 40 that currently cause operational problems will be eliminated.

### **3.5.5 US 36 / Rockville Road**

The improvements at US 36, like those at US 40, were directed at eliminating problems associated with traditional cloverleaf design. The layout of the proposed improvements can be described as a diamond interchange with one loop. A diamond interchange is one where the exit ramp termini normally line up with the on-ramp entrances, often at signalized intersections (in urban areas). This pattern would hold on the west side of I-465 at US 36. Due to the expected high demand for the movement from eastbound to northbound, a loop ramp would continue to serve this movement. The loop ramp would merge with the westbound to northbound ramp as a C/D road, which would then merge with the mainline.

This design improves the intersection operation at High School Road by extending the distance between the southbound off-ramp and the intersection. The same is true of the northbound off-ramp and Mickley Avenue. Weave movements on I-465 and on US 36 that currently cause operational problems will be eliminated.

### **3.5.6 10<sup>th</sup> Street**

Changes at this interchange are summarized as follows:

- North to east – signalized ramp terminus, compared to free flow merge onto 10th Street.
- North to west – signalized ramp terminus, compared to loop ramp in northeast quadrant.
- South to east – signalized ramp terminus, compared to loop ramp in southwest quadrant.
- South to west – signalized ramp terminus, compared to free flow merge onto 10th Street.
- East to north – modified loop ramp, joining with westbound to northbound ramp to form a C/D road before merging with I-465.
- East to south – right turn at signalized intersection on 10th Street, compared to free-flow ramp.
- West to north – modified free-flow ramp, joining with eastbound to northbound loop ramp to form a C/D road before merging with I-465.
- West to south – left turn from signalized intersection on 10th Street, compared to fully directional ramp.

As at US 40 and US 36, the proposed design would improve the operation of adjacent intersections east and west on 10<sup>th</sup> Street.

### **3.5.7 I-74**

The most notable change to this interchange is that a signalized intersection would be introduced west of I-465. I-74 freeway traffic destined for I-465 would be segregated well in advance of the intersection and would continue to flow freely, without stopping. Presently the first intersection (as one approaches from the west) is east of I-465. The site distance at the existing intersection is poor as one

crests over the bridge carrying I-74 over I-465. An earlier intersection will slow traffic down before it reaches High School Road.

Today this interchange is a full cloverleaf. With reconstruction two loop ramps would remain to serve the two lightest movements, west to south and east to north. In each case these loop ramps would merge with the east-to-south and west-to-north ramps to form C/D roads before merging with the mainline of I-465. The heavy movements, north to west and east to south would be served by two-lane ramps. The north to west ramp would be directional.

### **3.5.8 38<sup>th</sup> Street**

Today this interchange is a partial cloverleaf with a single loop ramp serving the westbound to southbound movement. The proposed design calls for adding a second loop in the southeast quadrant serving eastbound to northbound travel. The off-ramp termini would be pulled in tighter to I-465 so that the spacing to adjacent intersections is increased. Traffic signals will be added at the southbound and northbound ramp ends, thus eliminating weaving for those wishing to make left turns at adjacent intersections.

## **3.6 Preferred Alternative**

Together the interchange and mainline/auxiliary lane additions noted above constitute the Preferred Alternative.

## **3.7 Schedule and Cost**

The schedule for the project anticipates construction starting no earlier than 2005. The preliminary right-of-way and construction cost estimate is \$425 million in 2002 dollars.